

Claims

1. Method to produce a copy protected record carrier for digital data, **characterized by**

- 5 - determining at least one predetermined repetitive bit pattern which encodes into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and that is below a second predetermined limit,
- replacing at least one part of the digital data to be recorded by the at least one predetermined repetitive bit pattern and/or inserting the at least one
10 predetermined repetitive bit pattern into at least one part of the digital data to be recorded, and
- transferring said digital data including the at least one replaced and/or inserted part onto said record carrier by a mastering process so that said accumulated digital sum value which exceeds said first predetermined limit
15 and is below said second predetermined limit is achieved in said at least one replaced and/or inserted part.

2. Method according to claim 1, **characterized in that** said predetermined repetitive bit pattern is selected so that an abnormal writing beam deviation from
20 the ideal position of a writing beam of a record carrier recording device for recordable record carriers which writing beam deviation is big enough to ensure that a writing process will be aborted or disturbed.

3. Method according to claim 1 or 2, **characterized in that** said
25 predetermined repetitive bit pattern is selected so that an abnormal reading beam deviation from the ideal position of a reading beam of a record carrier reading device which reads a copy of the copy protected record carrier recorded on a recordable record carrier which reading beam deviation is big enough to ensure that a reading process will be aborted or disturbed.

4. Method according to anyone of the above claims, **characterized in that**
30 said predetermined repetitive bit pattern is selected so that an abnormal writing beam deviation from the ideal position of a writing beam of a record carrier recording device for recordable record carriers and is selected so that a abnormal
35 reading beam deviation from the ideal position of a reading beam of a record carrier reading device which reads a copy of the copy protected record carrier recorded on a recordable record carrier wherein the combined effect of writing

beam deviation and reading beam deviation is big enough to ensure that a reading process will be aborted or disturbed.

5. Method according to anyone of the above claims, **characterized in that**
5 said predetermined repetitive bit pattern is selected so that an abnormal reading beam deviation from the ideal position of the reading beam of a record carrier reading device which reads the copy protected record carrier which deviation is small enough to ensure a readability of the copy protected record carrier.

10 6. Method according to anyone of the above claims, **characterized in that** said predetermined repetitive bit pattern is selected so that merge bits are predefined and therefore not changeable by the recording electronic of a recorder due to design rules of the digital data content of the record carrier.

15 7. Method according to anyone of the above claims, **characterized in that** said predetermined repetitive bit pattern is selected so that the signal corresponding to the digital data shows a certain positive or negative digital sum value within a predefined time.

20 8. Method according to anyone of the above claims, **characterized in that** in case of audio, said predetermined repetitive bit pattern is preferably selected so that a low analog audio DC value is achieved.

25 9. Method according to anyone of the above claims, **characterized in that** in case of audio, said predetermined repetitive bit pattern is preferably selected so that an equal analog audio DC value in all audio channels is achieved.

30 10. Method according to anyone of the above claims, **characterized in that** in case of audio, said predetermined repetitive bit pattern is preferably selected so that an audio output signal corresponding to the digital data is achieved, which analog audio output signal has a frequency and/or amplitude which cannot be heard or can hardly be heard by humans.

35 11. Method according to anyone of the above claims, **characterized in that** in case of audio, before and after said predetermined repetitive bit pattern a ramp signal is added which ensures a smooth transition from and to the digital data signal content before and after the signal content of the predetermined repetitive bit pattern.

12. Computer program product, comprising computer program means adapted to perform the method steps as defined in anyone of claims 1 to 11 or parts thereof when being executed on a computer, digital signal processor, or the like.

5 13. Device to produce a record carrier with copy protection, **characterized by**

- a first unit for replacing at least one part of the digital data to be recorded by at least one predetermined repetitive bit pattern and/or for inserting at least one predetermined repetitive bit pattern into at least one part of the digital data to be recorded, wherein said repetitive bit pattern encodes into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and that is below a second predetermined limit, and
- a second unit for transferring said digital data including the at least one replaced and/or inserted part to a record carrier production unit which produces said record carrier by a mastering process so that said accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit is achieved in said at least one replaced and/or inserted part.

20 14. Copy protected record carrier, **characterized by** at least one part comprising at least one predetermined repetitive bit pattern which encodes into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit.

25 15. Method to copy digital data stored on a record carrier with copy protection onto a recordable record carrier, **characterized by**

- searching for at least one part of digital data to be copied onto said recordable record carrier comprising at least one predetermined repetitive bit pattern which would encode into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit, and
- replacing said at least one part by a bit pattern which encodes into channel bits having an accumulated digital sum value that is below said first predetermined limit, or for deleting said at least one part.

35 16. Method to copy digital data stored on a record carrier with copy protection onto a recordable record carrier, **characterized by**

- searching for at least one part of digital data to be copied onto said recordable record carrier comprising at least one predetermined repetitive bit pattern which would optimally encode into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit, and
- encoding said at least one part non optimal into channel bits having an accumulated digital sum value that is below said first predetermined limit.

17. Computer program product, comprising computer program means adapted to perform the method steps as defined in claim 15 or 16 when being executed on a computer, digital signal processor, or the like.

18. Computer storage means, comprising a computer program product according to claim 17.

19. Device to copy digital data stored on a record carrier with copy protection onto a recordable record carrier, **characterized by**

- a searching unit to search for at least one part of digital data to be copied onto said recordable record carrier comprising at least one predetermined repetitive bit pattern which would encode into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit, and
- a replacement unit for replacing said at least one part by a bit pattern which encodes into channel bits having an accumulated digital sum value that is below said first predetermined limit, or for deleting said at least one part.

20. Device to copy digital data stored on a record carrier with copy protection onto a recordable record carrier, **characterized by**

- a searching unit to search for at least one part of digital data to be copied onto said recordable record carrier comprising at least one predetermined repetitive bit pattern which would optimally encode into channel bits having an accumulated digital sum value that exceeds a first predetermined limit and is below a second predetermined limit, and
- an encoding unit for encoding said at least one part non optimal into channel bits having an accumulated digital sum value that is below said first predetermined limit.